

CLUTCH SUCTION DISK FOR AIR COMPRESSOR OF VEHICLE AIR CONDITIONER

FIELD OF THE INVENTION

5 The present invention relates to vehicle clutches, and particular to clutch suction disk for an air compressor of a vehicle air conditioner and the method for manufacturing the same.

BACKGROUND OF THE INVENTION

10 With reference to Figs. 1, 2 and 3, a prior art clutch for a vehicle air conditioner compressor is illustrated. The clutch is formed by a belt wheel A, a suction disk, a brake disk C, etc. A center of the suction disk B has a penetrating hole. Several points of a bottom of the suction disk are welded to a disk D. A magnetic coil is placed in the hole. The suction disk B
15 must suffer from the vibration of the engine and magnetic waves. However, the prior art has the following advantages.

 Since the combination of the suction disk B and the disk D is by welding at several points, the welding will release due to vibration. A plurality of protrusions are formed on the bottom of the suction disk B and the upper side
20 of the disk D for combining the two, but this will weaken the structure.

 The various objects and advantages of the present invention will be more readily understood from the following detailed description when read in conjunction with the appended drawing.

25 SUMMARY OF THE INVENTION

 Accordingly, the primary object of the present invention is to provide a method for manufacturing a clutch suction disk for an air compressor of a vehicle air conditioner, comprising the steps of: punching a solid round cylindrical steel bar so that the steel bar to be as a flattened steel cylinder;
30 forming a recess in a central axis of the flattened steel cylinder by cool forge; expanding a bottom of the steel bar being expanded as a disk which is out of

a lower end of the flattened steel cylinder; folding an outer side of the disk upwards so as to form an outer cylinder which encloses the flattened steel cylinder by a further cool forge; punching a bottom of the recess so that the bottom descends downwards to be lower than a bottom of the outer cylinder; and forming a round hole with a predetermined diameter; at the bottom of the recess.

Moreover, the present invention provide a suction disk manufactured by above methods.

10 BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view of a prior art suction disk.

Fig. 2 is a cross section view of the prior art suction disk, belt wheel and brake disk.

Fig. 3 is an assembled view of the prior art suction disk, belt wheel and brake disk.

Figs. 4 – 7 shows the manufacturing process of the present invention.

Fig. 8 is a perspective view of the suction disk of the present invention.

Fig. 9 is a structural cross section view of the suction disk of the present invention.

Fig. 10 is a cross section view about the suction disk, belt wheel and brake disk of the present invention according to the present invention.

Fig. 11 is an assembled view of the suction disk of the present invention which is assembled to a belt wheel and a brake disk.

25 DETAILED DESCRIPTION OF THE INVENTION

In order that those skilled in the art can further understand the present invention, a description will be described in the following in details. However, these descriptions and the appended drawings are only used to cause those skilled in the art to understand the objects, features, and characteristics of the present invention, but not to be used to confine the scope and spirit of the present invention defined in the appended claims.

The present invention relates to a clutch suction disk for an air compressor of a vehicle air conditioner and a method for manufacturing the same. The suction disk is formed integrally through a series of punching and forging.

5 The method for manufacturing a clutch suction disk for an air compressor of a vehicle air conditioner comprising the following steps:

 Punching a solid round cylindrical steel bar; as illustrated in Fig. 4.

 Punching the steel bar again so that the steel bar is shorted; as shown in Fig. 5.

10 Forming a recess 10 in an axial central portion of the flattened steel cylinder by cool-forge; and a bottom of the steel bar being expanded as a disk 20 which expands out of a lower end of the flattened steel cylinder; as shown in Fig. 6.

 Folding an outer side of the disk 20 upwards so as to form an outer
15 cylinder 30 which encloses the flattened steel cylinder by a further cool-forge process; as shown in Fig. 7.

 Punching a bottom of the recess 10 so that the bottom descends downwards to be lower than a bottom of the outer cylinder 30;

 Forming a round hole 40 with a predetermined diameter; at the bottom
20 of the recess 10, as illustrated in Fig. 8 and a lateral view is illustrated in Fig. 9.

 With reference to Figs. 10 and 11, the above suction disk used in the clutch of a vehicle air conditioner air compressor can be used to replaced in the prior art suction disk B and cover D, as shown in Figs. 1, 2 and 3.

25 The present invention causes the suction disk to be more stronger and has precise sizes. The material is less than the prior art suction disk with a quantity of 30%. Thereby, the cost is reduced greatly. The precision is higher than the prior art. Thereby, steel with uniform crystal structure can be used in the present invention. The crystals can be filled in all the
30 structure so as to provide precise sizes. The forging process saves more material and the steps in the manufacturing process can be reduced so as to

be an impact and fatigue endurance properties. In the present invention, no welding process is used. Thereby, the strength of the suction disk is preferred.

Furthermore, the present invention relates to an integral formed clutch
5 suction disk for an air compressor a vehicle air conditioner made of above
mentioned method. The integral formed clutch suction disk comprises a
steel cylinder having a recess 10 through a central axis thereof; a disk
expanding from a bottom of the steel bar as a disk which is out of a lower end
of the flattened steel cylinder; an outer side 30 of the disk being folded
10 upwards so as to form an outer cylinder which encloses the steel cylinder; A
bottom of the recess is descended downwards to be lower than a bottom of
the outer cylinder; and a round hole 40 with a predetermined diameter is
formed at the bottom of the recess.

The present invention is thus described, it will be obvious that the same
15 may be varied in many ways. Such variations are not to be regarded as a
departure from the spirit and scope of the present invention, and all such
modifications as would be obvious to one skilled in the art are intended to be
included within the scope of the following claims.

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